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PUBLIC LANDS

BUREAU OF LAND MANAGEMENT



OUR PUBLIC LANDS . . .



"Conservation is a state of harmony between men and land. By land is meant all of the things on, over, or in the earth. Harmony with land is like harmony with a friend; you cannot cherish his right hand and chop off his left. That is to say, you cannot love game and hate predators; you cannot conserve the waters and waste the range; you cannot build the forest and mine the farm. The land is one organism. Its parts, like our own parts, compete with each other and cooperate with each other. The competitions are as much a part of the inner workings as the cooperations. You can regulate them—cautiously—but not abolish them."

(From "Round River—From the Journals of Aldo Leopold," edited by Luna B. Leopold, Oxford University Press, 1953.)

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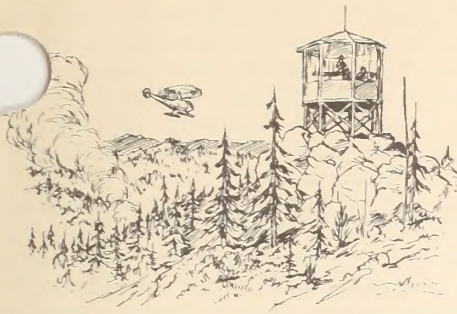
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COVER

Modern fire fighting has become a highly specialized operation, involving the latest techniques for supplying and transporting men and equipment. The cover photo shows fire fighting equipment being unloaded from a BLM airplane in western Alaska, where normal logistic problems are amplified by the great distances involved. For more about a fire in Alaska see page 8.



FIRE IN THE WOODS

FIRE fighting always has been and probably always will be an unpleasant, backbreaking job. It holds little glamour for the tired, footsore man on the fireline or the men whose job it is to keep him adequately supplied with food and equipment. But each year hundreds and hundreds of men from all walks of life are called upon to assist in the battle against one of Man's oldest enemies—uncontrolled fire.

Fires are not all the same. For those who live in the cities and towns, fire means the wailing howl of a siren announcing the prompt dispatch of firemen and mobile equipment. In most urban communities a regular force of equipment and men (or a standby reserve of public spirited volunteers) stand ready at all times to protect the lives and property of the community. To report a fire is to lift the telephone receiver and dial a number, or pull the level in a firebox down once and let go. Fire in a city or town may often have a very personal touch (though it is far too easy to ignore the sounds and become complacent about fire). It may be a house on a nearby street, a building around the corner, or a runaway grass fire on a vacant lot. But it is close to home and the charred, blackened results are there for any one to see.

Fire in the woods or back country is a different matter. No one may know when they start. There may be no sirens to signal that someone is on the way to put them out. Fires may burn for hours or even for days before they are discovered, unless there is an adequate detection system to scan or patrol the area.

Fire in the woods or on the range may be a much less personal experience. Relatively large forest and range fires may in fact directly affect only a few people—a lumberman, a rancher, a farmer, and a suppression crew. But forest and range fires indirectly affect everybody, because they destroy or damage valuable resources that are a part of the Nation's storehouse of raw materials.

Fire in the forest or on the range destroys water-holding vegetation, allowing the destructive erosion of fertile topsoils.

Fire destroys the standing timber for harvest and the young seedlings that would be tomorrow's crop.

Fire destroys beautiful scenery and recreation areas.

Fire destroys the home and food supply of both

domestic livestock and native wildlife.

Fire protection and suppression on public domain lands is a large and important job of the Bureau of Land Management. Great strides have been made in reducing forest and range fires on our public lands. New techniques and equipment are constantly being pressed into service to reduce annual fire losses.

Fires are being attacked by aerial water and chemical bombing. Helicopters are aiding and speeding up attack time.

Fire danger rating systems are being installed to aid fire prevention and presuppression programs.

Fires during 1957 were unusually severe, particularly in Alaska and in some areas of the West. A total of 403 fires in interior Alaska burned an estimated 5,034,000 acres of forest, tundra, and muskeg.

Fire in Alaska presents detection and suppression problems of enormous proportions. Distances are very great—supply lines from headquarters to fire lines may exceed 500 miles. Transportation and access are severely limited. The fire season is long, precipitation is low, and midsummer dry lightning storms are frequent.

Fire control in Alaska by BLM has, in spite of these handicaps, reduced the average annual burn by 75 percent since 1946.

Fire control programs have been developed. Program accomplishment will demand an expanded fire control effort. It will mean additional modern fire-fighting equipment; cooperative aerial patrols for early fire detection; increased contracts for large aircraft and helicopters for transportation and supply; a trained crew of smoke jumpers for quick initial attack; and adequate logistic facilities at strategic locations to house equipment and supplies.

Fire protection and suppression on public lands is a necessary part of the Nation's land and resources management and conservation. It is a cooperative job that requires the best efforts and support of everyone.

Fire prevention and control cannot be left up to "someone else." Everyone can and must help with the job, in the city, on the farm, and in the woods.

Fire control on our public lands is everybody's personal business—**PREVENT FOREST AND RANGE FIRES.**

End

PUBLIC LAND GRAZING DOWN UNDER

by ROYALE K. PIERSON, Range Officer, BLM

NEW ZEALAND was chosen as the host country for the Seventh International Grassland Congress in 1956 for good reason. Seventy-eight percent of the Commonwealth's economy is based on the products of its lush and verdant grasslands. A more fitting background for a meeting of grassland workers could scarcely be found anywhere.

A few miles outside of Palmerston North, seat of the Grassland Congress, delegates could stand on a low hill called Mount Stewart and look out over more than a million acres of some of the most productive grassland in the world. The highest quality pastures produce from 400 to 500 pounds of butterfat per acre (the principal measure of dairy product output)—an exceptionally high rate of productivity. Next in order of productivity are the sheep farms which carry up to 12 ewes per acre year long—also representing a very high carrying rate for the land.

The International Grassland Congress is an informal organization of the world's leading research workers and experts in the field of grassland management. The Congress assembles at four-year intervals to exchange information on scientific advancements in grassland technology

and to observe the handiwork of colleagues in the host countries during pre- and post-congress tours. Following two weeks of formal sessions and organized discussions at Massey Agricultural College, tours had been arranged for the delegates to observe grassland management both in New Zealand and Australia. The writer's chief interest was with natural grazing areas in the lower rainfall zones. So he joined with two other members of the United States delegation in a tour especially tailored to view the largest area of rangeland.

The New Zealand Government has many counterparts of agencies in our Federal Government such as a Department of Agriculture, Forest Service, Soil Conservation Service, Bureau of Lands and Surveys, and others. Representatives of these agencies were most cordial and spared no effort in making advance contacts with field personnel to serve as guides and with range operators or "run holders" as they are called in New Zealand. Likewise, during the Congress sessions, similar arrangements were made with Australian delegates to visit their country.

The Commonwealth of New Zealand is comprised of two principal islands with a total area

SOUTHERN ALPS provide scenic background for New Zealand grazing. Sheep graze up to snowline during summer months.



of about 66 million acres or about the size of the State of Colorado. The occupied area totals 43 million acres with 16.6 million acres of Crown land reserved and 15.8 million acres under lease, principally for grazing. The Crown or Commonwealth lands are very much like our public lands.

At the present time the total area of grassland in New Zealand is over 32 million acres of which 18 million acres are in improved pastures developed from swamp forest and hill bush country. The balance of 14 million acres is in native range, mostly tussock (bunch grass) grassland with 2 million acres in the north island and 12 million acres in the south island.

From the standpoint of grass production, New Zealand is a perfect "natural." The climate of the north island is cool and moist with little seasonal variation in temperature and precipitation. Rainfall varies from 30 to 100 inches per year, almost equally distributed during the 12 months. The grass and pasture forage plants grow year-long with only minor fluctuations in production rates.

The soils are of such a nature that all that is needed is two hundred weight of superphosphate per acre with a seeded mixture of perennial rye grass and white clover to start a cycle of continuous growth. Nitrogen furnished by the clover supplemented with manures from grazing animals gives the sword a brilliant emerald green color characteristic of the whole landscape.

New Zealand's grasslands support nearly 40 million sheep and 6 million cattle. The products of these lands supply 75 percent of the lamb and mutton, 40 percent of the butter, 30 percent of the cheese, and 20 percent of the wool that goes into international trade. These percentages emphatically reveal the tremendous productivity of the Commonwealth's grassland.

In contrast to the highly improved pastures the native tussock ranges have an average grazing capacity of four acres per ewe year-long. Also, while the farms are held in fee simple and are from 120 to 200 acres in size, the rangelands are Crown lands leased in large blocks containing many square miles.

Leases are granted for 33-year periods at annual rentals of from \$1 to \$3 per square mile, with additional requirements for annual improvements such as water development, fencing, tree planting and other practices. The lessee or "run holder" does not have title to the land on which his headquarters are located and should he default on his lease, his successor must purchase all buildings and improvements. The lease holder may cultivate such land as may be needed for supplemental forage or develop an irrigation system.

The tussock rangelands include a dominant bunch grass which generally is a species of *Danthonia* but may also be *Poa*s, *Festucas*, or others. Some are slightly palatable but the principal forage plants are in the understory and consist of

(Continued on page 12)



GRASS TREE is example of unusual vegetation in Australia.



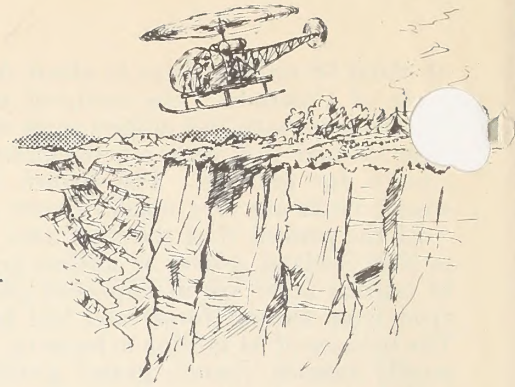
PORCUPINE GRASS. This is in typical Kangaroo country in the State of South Australia.

RED TUSOCK GRASS with understory of forage grasses on typical New Zealand range on north island.



AIRBORNE ENGINEERS

by DONALD B. CLEMENT, Cadastral Engineering Officer, BLM



IN the early days when surveying parties were operating in territory which was largely unexplored wilderness, public land survey crews traveled by foot or canoe. As the country opened up, packhorses and saddle horses moved survey camps, equipment, and men. Years later, wagons and buckboards could take advantage of the early roads and wide trails. Now the automobile and motortruck can take care of much of the heavy work of transporting survey crews and their equipment.

But BLM's survey parties have become airborne. The helicopter has made its appearance for transporting field parties from the survey

camp to the point for actual lines operations, and for moving the crews along the line of survey. This represents a big change from earlier days; there are BLM surveyors today who can vividly recall the days of the mule and pack horse.

The whole subject of transporting survey parties was brought to a focus when BLM embarked on an accelerated program of surveying so-called school sections in southeastern Utah in 1954. This area is in rough, mountainous country, tributary to the Grand Canyon. Its spectacular ruggedness seriously challenged the stamina and ingenuity of survey parties to traverse and complete their surveys.

RAPID TRANSIT to survey work area is furnished by helicopters in southeastern Utah. Carrying three men these whirlybirds save many tired miles of walking over rugged terrain.



As work progressed into the more and more remote areas, BLM officials and engineers began studying the feasibility of using helicopters for moving survey crews and their equipment over the rugged, broken terrain.

"But," some people have asked, "why is it necessary to survey public lands in areas that are so rugged and remote that man cannot even get through them on foot?"

The reason is that public land surveys have always preceded any new development. These surveys are needed before roads can be laid out and built. Even in the early days of settlement in the western United States, homesteaders pioneered lands on which the public land surveyors had already laid out the rectangular survey grid. Surveys in this area of southeastern Utah could be made on foot, but only at a cost much higher than that incurred by using helicopters.

On the basis of early studies a limited helicopter operations test was made in October 1956. The results were so encouraging that a substantially enlarged program was undertaken during the 1957 field season. The results were even better than early expectations.

Prior to the introduction of helicopters, surveys in this area of southeastern Utah had been made at a cost of approximately \$155 per surveyed mile, with each crew covering an average of 1.2 miles per day. Using helicopters the cost of each surveyed mile has been reduced to about \$125, and each crew can now complete an average of 2.6 miles each day. In other words, the cost of surveys in these rugged mountainous areas has been reduced by approximately 20 percent while the output of the crews has been more than doubled.

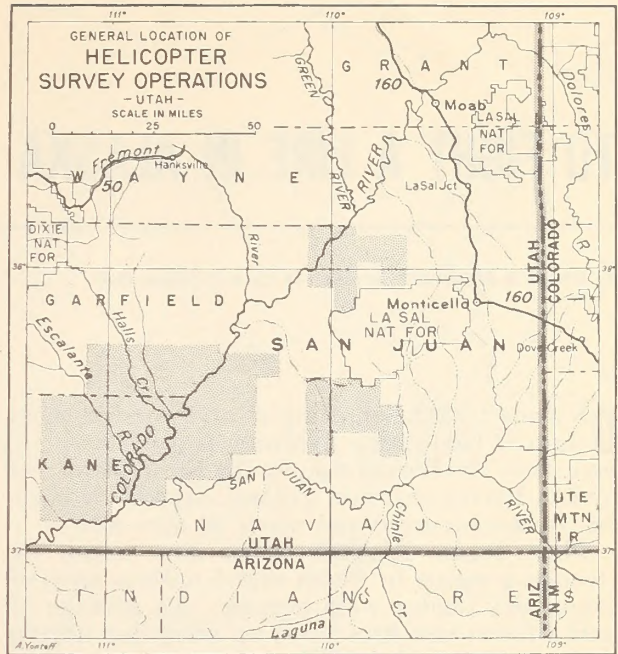
The spectacular results of BLM's helicopter operations in southeastern Utah have clearly shown the feasibility and economy of aerial transport in areas where large-scale surveys are to be made over terrain too rough for trucks and jeeps.

One place where helicopters may offer special opportunities for accelerating surveys is in Alaska. So far only about 2,600,000 acres of Alaska's 365,481,600 acres have been surveyed. In this rugged mountainous wilderness transportation in the back-country is always a problem. As the Territory continues to grow and develop, helicopters will probably greatly assist large scale survey operations.

Another area where helicopters may be put into service is in portions of Arizona, which still has over 23 million unsurveyed acres.

This project is an excellent example of how Federal land management programs are being continually improved, to do the best possible job at minimum cost, and meet the ever growing demands upon the Nation's public land and resource base—to meet the needs of a growing population and national wealth.

End



STEEP AND DEEP are the canyons being surveyed by helicopter.

Total receipts under the Mineral Leasing Act of 1920 from February 25, 1920, through June 30, 1957, are \$634,320,697.57, of which \$613,433,648.08 is from oil and gas; \$18,119,848.17 from coal; \$851,984.40 from sodium; and \$1,915,216.92 from phosphate leasing.

TO FIGHT A FIRE IN ALASKA

by ROGER R. ROBINSON, Alaska Fire Control Officer, BLM

ON June 7, 1957, following several weeks without rain, a heavy, dry-lightning storm moved inland from the Bering Sea, up the Kuskokwim and Yukon Rivers, and into Central Alaska. Numerous strikes occurred and about 20 fires started.

Thus began Alaska's worst fire season on record—a season in which over 5 million acres of forest and tundra were burned. An average of half a dozen new fires flared up every day during the next six weeks. This is a story about one of them.

The first fires located in the Flat-Iditarod area (see map) were near mining grounds made famous in the Gold Rush of 1911-12.

Much of this area was burned over in those years by prospectors who impatiently resorted to setting fires as a means of clearing brush, trees, and moss from their placer claims. Some of them also mistakenly thought that fire and smoke would drive away the clouds of mosquitos which made life in the bush a never-ending battle of man-against-insect.

That the old-timers were unsuccessful was evident from the hordes of mosquitos that plagued

fire fighters throughout the summer. Only by making full use of new insect repellents was it possible for fire crews to do an effective fire-fighting job.

Iditarod is about 350 air miles west of Anchorage and 400 air miles southwest of Fairbanks. Planes from Anchorage must cross the towering peaks of the Alaska Range to get to McGrath and the Iditarod area.

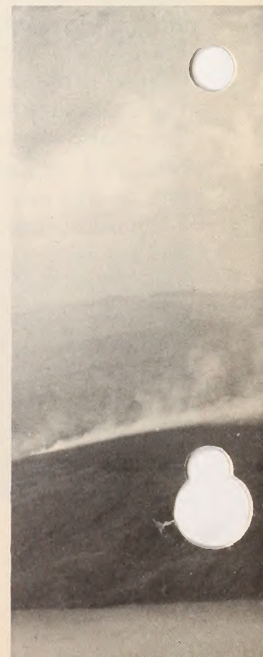
Several fires had started earlier in the general area of the Kuskokwim River. Forester Wallace Fixsen at McGrath was already busily shuffling men and equipment to fires when the local phone at his headquarters rang. His wife, Lou, who is the very competent nerve-center of the McGrath station when Wally is not around, grabbed the phone and heard the CAA radio operator relay a fire report.

The fire had been spotted by Bob Curtis, one of Alaska's special breed of pioneers—a bush pilot—who was flying behind the lightning storm in the Iditarod area.

Immediate action was necessary. It was dry and the fires were likely to blow up.

FLYING BANANA ferries in men and equipment to Flat as U. S. Air Force aids fire control operations.

SCATTERED FIRES make job started by windblown sparks



Lou immediately called Anchorage and Fairbanks Fire Dispatchers Russ Hansen and Joe Moron on the radio. Fairbanks fire control aids were already on other fires. Anchorage had two men ready to go, but time would be needed to rout out additional fire fighters. More men were also needed for other fires. Anchorage undertook the job.

A fire crew was assembled and a C-47 was chartered to fly the men and equipment in to the fire.

The crew, with V. J. "Judge" Henderson in charge, arrived at Flat after a two and a half hour flight across western Alaska. There an Air Force H-21 "flying banana" helicopter met the crew. They were then ferried, eight at a time, to a spot about 17 miles south of Flat.

Here the first camp was set up. It was near a stream and the only clear space for miles around where the helicopter could safely land.

The place was named Camp Hesse, after Hank Hesse, who only two days before had come to Anchorage from Fairbanks to train cargo drop-pers. He had been pressed into service on this fire "for a day or two." Actually, Hank was shifted from fire to fire in the Kuskokwim area and didn't see his Fairbanks headquarters again for several weeks.

When the first crews arrived at the fire, the smoke was so dense it was impossible to fly around the entire perimeter of the fire and size it up. But Judge, a veteran fire boss in Alaska, hit the fast-moving head of the fire. A crew worked south of Camp Hesse and Hank and Jim Kreiman took another crew north.

As Judge says, "I brought my crew back to Camp Hesse early the next morning to rest for a few hours and be ready for patrol action later in

(Continued on page 14)



FIRE CREW stands ready to board plane for Flat.

CARGO DROPPERS prepare to jettison supplies to waiting crews below. Parachutes are worn as safety measure.





NEW PUBLIC LAND GRAZING FEE

The new grazing fee to be charged for the use of the Federal range during 1958 will be 19 cents per animal-unit-month.

The new fee is based on average livestock prices at markets in the 11 western States during 1957, based on data supplied by the Agricultural Marketing Service, United States Department of Agriculture. Grazing charges are based on the number of livestock permitted to use the Federal range and the length of time for which they use it. The new fees charged for each month's use will be 19 cents per head of cattle, 38 cents per horse, and 19 cents for each 5 sheep or goats. No fees will be charged for livestock under six months of age.

The new fees apply to all Federal grazing lands administered under Section 3 of the Taylor Grazing Act and affect nearly 30,000 stockmen who graze almost 12 million head of livestock on Federal rangelands.

The 1958 fee is based on a new grazing fee formula ordered by Secretary of the Interior Fred A. Seaton, and endorsed by the National Grazing District Advisory Board Council. The new fee schedule was to have taken effect on January 1, 1957, but Secretary Seaton postponed it for one year as a drought relief measure. The new fees went into effect on January 1, 1958.

Public land grazing fees during 1957 were 15 cents a month per head of cattle, 15 cents a month for 5 head of sheep or goats, and 30 cents a month per horse.

NEW OIL AND GAS LEASING RULES

On January 8, 1958, Secretary of the Interior Fred A. Seaton signed new regulations for oil and gas leasing on Federal wildlife lands. A public hear-

ing on the proposed new rules was held in Washington, D. C., on December 9, 1957.

The new regulations prohibit oil and gas leasing on all wildlife refuges, unless it can be demonstrated that, because of activity outside the refuge, oil and gas under the refuge lands is being drained off.

On so-called game rangelands, Federal-State cooperative areas, and on Alaska wildlife areas leasing will be permitted except in certain specific areas essential for the protection of fish and wildlife values. All leasing permitted, however, would include safeguards for fish and wildlife. The final decision on any leasing on Federal wildlife lands, however, rests with the Secretary of the Interior.

1958 STAR GUIDE FOR SURVEYORS

The astronomical almanac, issued annually by the Bureau of Land Management is now off the press.

The booklet, *The Ephemeris—1958*, contains tables and charts of the daily positions of the sun, and hourly changes in declinations, upper culminations, and elongations of Polaris (the North Star). Semimonthly positions of 28 other selected stars are also given.

The Ephemeris, which in recent years has listed the brighter stars in the equatorial belt, is a supplement to the *Manual of Instructions for the Survey of Public Lands of the United States*. It affords the necessary basic data for field astronomical determinations required in present-day surveying practices.

The Ephemeris may be purchased for 25 cents and the *Manual of Instructions* for \$2.75 from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.

WAYSIDE PLANTS

Wayside Plants by Nelson Coon (Eaton Press, Watertown, Mass.) not only serves as a popular guide to common plants encountered by the urban motorist along the highways but also brings together a wealth of information on ways of using these plants for greater enjoyment of them. While written principally for the Northeastern States, the reader will find many related species or counterparts extending across the breadth of the country.

The author has selected a list of 100 plants including herbs, shrubs, and trees which he describes in sufficient detail for easy identification. In addition his choice has been guided by individual plant properties for use as food, crafts, landscaping, medicinal, and decorative purposes.

Many old recipes, some the products of early day folklore, have been recorded and preserved for the modern wayside nature lover. The reader will be able to prepare cat-tail-pollen pancakes, nettle soup, puffball steaks and elderberry wine after consulting this useful compendium. There are a group of interesting mushroom recipes. The author's easy style and enthusiastic tone will sharpen the reader's curiosity to explore further into the subject of useful native plants.

ANNUAL REPORT

The Annual Report of the Director of the Bureau of Land Management, contained in the published report of the Secretary of the Interior, reviews BLM accomplishments during fiscal year 1957.

Receipts from the sale and development of public lands and resources reached an all-time high of \$109,850,654. The receipts for fiscal 1957 exceeded by almost 9 percent the returns in 1956 of \$100,992,667, which was itself a record breaking total at that time. Costs of BLM's fiscal 1957 operations amounted to \$23,776,153.

In addition, the Bureau received \$2,208,703 from rents and royalties for mineral leasing on the submerged lands of the Outer Continental Shelf. BLM's total revenues for fiscal year 1957 were thus \$112,059,358. Gross receipts were substantially below those received in 1956 because of a court order prohibiting any oil and gas leasing on the Outer Continental Shelf, pending action by the United States Supreme Court to clarify the boundaries of the Outer Continental Shelf lands.

Of the total of \$112,059,358 gross receipts, \$38,700,056 was distributed to 26 public land States and Alaska, of which \$9,805,664 went to the 18 O&C timber land counties of western Oregon. Other distributions of BLM receipts were made as follows: \$43,159,825 was deposited to the Reclamation Fund; \$241,028 was earmarked to Indian Trust Funds; \$26,124,400 went into the General Fund of the United States Treasury, \$564,846 was designated for range improvements, and \$3,269,201 was transferred to other agencies.

Bureau of Land Management receipts came principally from the following sources: Mineral leasing, \$83.4 million; O&C timber sales, \$19.6 million; sale of public land and timber, \$5.4 million; grazing fees and leases, \$2.3 million; service fees and commissions, \$1.0 million.

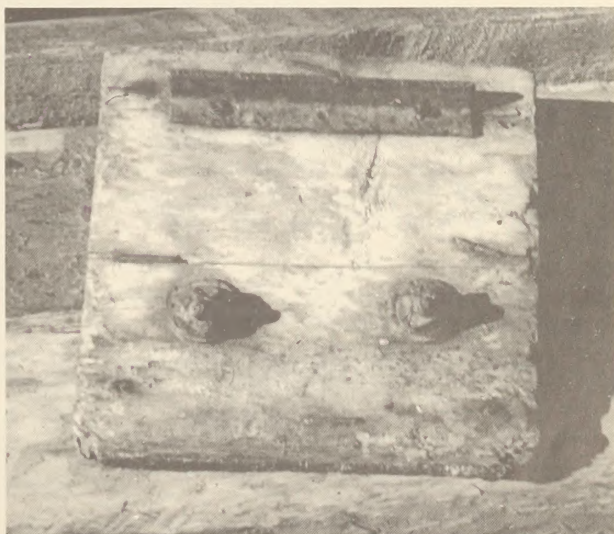
New applications received for the use or ac-

(Continued on page 15)

?WHAT IS IT?



Top View.



Bottom View.

(For answer turn to page 15)

GRAZING DOWN UNDER

(Continued from page 5)

such grasses as sweet vernal, Yorkshire fog, hair-grass, annual bluegrass, goose grass, wheatgrasses and palatable Danthonias. The run holders had formed "improvement associations" for the purpose of obtaining better species of forage plants, seeding and fertilizing the native tussock ranges. Removal of undesirable range plants is also included as an improvement practice and such familiar invaders as cheatgrass and goatweed were encountered in several locations.

On the improved pastures Romney-Marsh sheep were almost universally produced because of wool and lamb size characteristics. This breed is less gregarious than others, which is an advantage in obtaining good dispersal of animals in the small paddocks (pastures) under "mob" grazing on very short rotations.

The range sheep were strains of Merinos which were turned out without herders and roamed high up into the mountains in small bands. Once a year the range sheep were gathered for lambing and shearing after which they were again turned out. Bringing the sheep down from the high, rugged peaks of the Southern Alps is an extremely arduous task, fraught with the danger of snowstorms and avalanches. Unattended ranging of sheep is possible in New Zealand because of the lack of predators. Before settlement by white men the islands' only mammals were two species of bats. There were a few species of ground nesting birds and today, the nearest thing to a predator is a small parrot-like bird called a kia bird which occasionally kills sheep. Otherwise the sheep are free to roam at will and follow the snow line as it recedes higher into the precipitous peaks.

Range lambs are usually sold to operators of the so-called fattening farms located in the lower valleys in the areas of improved pastures. Fat lambs are marketed at dressed weights of around 35 pounds which is the size demanded by United Kingdom and continental consumers. It is interesting to note that the port of Dunedin had the world's first commercial cold storage processing plant established in the early 1870's. The ad-

vent of such plants together with the development of refrigerated shipping space were factors which stimulated large-scale settlement of the islands and the extensive development of their grasslands. Before 1870 the principal exports were wool and tallow.

The islands are largely populated by people from United Kingdom Countries who brought with them their ingrained desire for both outdoor and organized sports. As a result, because of the lack of indigenous mammals, importations of both small and big game were made into the islands. Red deer from England for example, when liberated in a new environment entirely free from the accustomed population checks such as parasites and predators, suddenly exploded into huge populations. Entire watersheds were threatened by destruction from an excess number of grazing animals. It was necessary to undertake control measures, so that there would be sufficient forage available.

Many other species of deer were also imported including the American white tail and mule deer, wapiti and moose, several species of Asiatic deer, and the Indian tar and chamois from Switzerland.

Many game birds were also introduced which have found their new home to their liking. As in Australia, both rabbits and European brown hare were brought in with near-disastrous results. When ferrets were introduced to control the rabbits, these voracious animals turned their attention to the hapless native ground-nesting birds rather than the hares and rabbits. There were no snakes on the island at the time of settlement, an absence which still exists today.

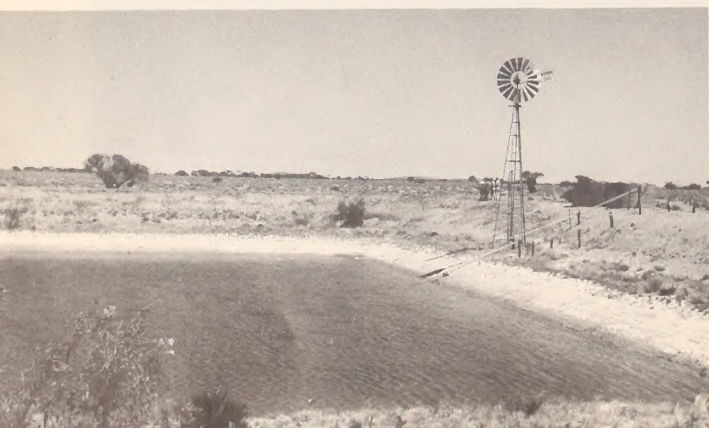
The New Zealand range country lies principally in a setting of mammoth snowclad mountain peaks of the Southern Alps and huge glacial lakes connected or drained by rushing streams of blue-white water. Some of the lakes appear milky from the fine glacial flour held in suspension. For the most part, however, they are crystal clear and are stocked with rainbow trout introduced from the United States.

The Southern Alps abound with glaciers including the huge Tasman Glacier, the longest in the temperate zone. This is the only location in the world where an alpine glacier terminates at sea level amid lush subtropical vegetation. The run holder in New Zealand has a spectacular setting for his operations.

Australia, like New Zealand, is a land of many contrasts, unique and interesting vegetation, and many opportunities for exciting new experiences. One has the feeling of being truly "down under." The sun is in the north, the shadows fall to the south and at night one is oriented by the Southern Cross instead of the Big Dipper and the North Star. Here in Australia we found the same cordial reception we experienced in New Zealand.

Most of Australia's population resides in the large coastal cities of Sydney, Melbourne, Adelaide, Perth, and Darwin. The eastern coast

RANGE IMPROVEMENTS bear close resemblance to U. S. structures. Windmill pumps water to storage tanks at right.



fringe lying in the lee of a low range of mountains receives abundant rainfall and improved grass- and similar to New Zealand have been developed. The continent's only large river system, the Murray River, arises on the western slopes of the mountains and flows southwesterly entering the sea near Adelaide. A large gravity diversion system from the Murray River irrigates a substantial acreage in the States of New South Wales and Victoria but the vast interior of the continent is arid and very sparsely settled.

This region of endless plains and plateaus was the main object of the Australian tour because of its similarity to much of the range country in the western United States. Friends made at the Grassland Congress in New Zealand were on hand with arrangements completed down to fine details that would fill every hour of our stay in Australia. The Australian Commonwealth Government is situated in Canberra in the Australian Commonwealth Territory. This large tract of land is a rough counterpart of the District of Columbia in the United States.

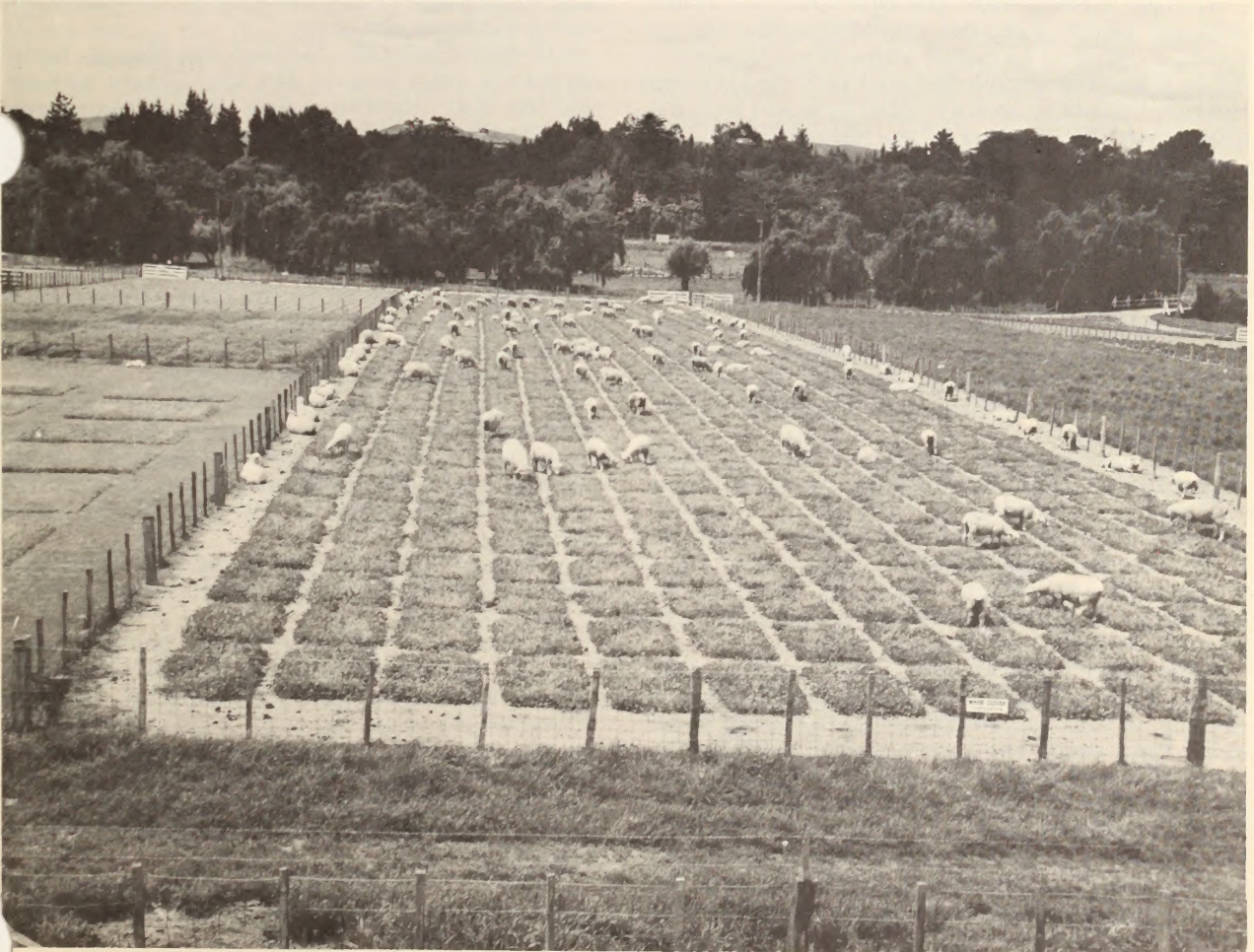
Canberra is a very modern city having been established in 1927, following a general pattern of that designed for Washington, D. C. Canberra is the headquarters for the Commonwealth Industrial and Scientific Research Organization, which among other things includes the experiment stations dealing with range management problems. After visiting with the research workers for several days the tour set out for the bush country in the State of South Australia.

An area in the northern part of the State was selected for an extensive tour because it is a vast area of salt desert shrub types. The general plant zones in the dryer parts of Australia are classified according to the dominant species of Eucalyptus. This common Australian tree exists in 660 known species and since it hybridizes freely the numerous subspecies have not as yet all been described.

The Eucalypts thrive in all rainfall zones and at all elevational levels, from rain forest to semi-arid dessert. Certain species of Acacia are also found in the dryer regions. For example, the salt

(Continued on page 14)

RANGE RESEARCH. Patchwork quilt of various grass species measure forage palatability at Palmerston North Research Station, New Zealand.



GRAZING DOWN UNDER

(Continued from page 13)

desert type in the seven-inch rainfall zone is known as the Mulga type. Associated with the Eucalypts and Acacias are various species of salt desert shrubs such as Kochia and Atriplex. These browse plants are excellent sheep feed and the sheep graze here inside of fenced paddocks without herders.

The Crown or public lands are leased for periods up to 99 years. They are not open for settlement unless so classified and designated by the Commonwealth government. The stockmen or "station" owners, as they are called, have made very extensive improvements and invested large sums of money in developing the bush country.

The South Australian sheep stations or ranches are enormous in size. An area of 120 square miles is considered a small station, and a large station may take in as much as 700 square miles. Sheep numbers range from 10,000 to 25,000 per station depending upon the size and grazing capacity of the station. In this part of South Australia the grazing capacity varies from 30 to 50 sheep per square mile year long.

Annual lease rentals are equivalent to about \$2.25 per square mile and in addition the station owner is required to install improvements according to a schedule established by the State Grazing Board. Failure to comply with the rental and improvement requirements of the lease will result in a loss of the lease and sale of all improvements to a successor.

The sheep, mainly of Merino strains, are loose herded in large paddocks usually grazed on a rotation basis. The stations are fenced and cross fenced into many paddocks with rabbit proof fencing on both interior and exterior fences. In some cases the exterior fence is constructed to exclude dingos, the Australian wild dog which is the only predator of any consequence to the station operator.

The typical station operator in this region is well educated, employs a high degree of technical skill and has a good grasp of range management science. He enjoys a high standard of living even when alone on his isolated station many miles from the nearest settlement. Most of the stations visited had telephones and short-wave radios, electric powerplants and running water.

After observing grazing on public lands in Australia and New Zealand the writer concluded that grazing in the United States and grazing down under have many things in common. While the run holder and station operator may enjoy an unusual security of tenure, they have the disadvantages of isolation and long distances to market. One characteristic found universally among stockmen is their fine display of hospitality and the writer and his colleagues found the run holder and station operator no exception. **End**

TO FIGHT A FIRE

(Continued from page 9)

the day. Jim's crew came in a little later. So far we had put in about 10 miles of fire line—either by backfire or by direct attack. The lines held.

"But by this time the distances were too great to walk the crews. We were temporarily without transportation since the Air Force helicopter returned to Flat as soon as our men and gear were unloaded to work on other fires.

"One of our planes overhead said a helicopter was due any minute. We didn't dare move camp on foot for fear of not being found in the heavy smoke. In the meantime the pilot with the two-place helicopter was trying to locate us, but failed. But later he found us. Right along with him came the Air Force 'copter with more men and Ron Schaefer.

"Schaefer and I went out in the little 'copter to locate a new camp site. We found one and marked it with a yellow tarp. We left Schaefer and returned to Camp to send fire fighters out. Six men from Copper Center volunteered to hike in to the new camp. By next morning Schaefer and the crews were seen working on the fire. More men were ferried in to the new camp which was on the northeast end of fire.

"At last the smoke thinned out enough to let me take a quick look at the fire. There was not one but four lightning fires in the same area, several miles apart! They were burning together so I took most of the remaining men from Camp Hesse to set up another base camp at the southwest end of area.

"The fire had two actively burning fronts, fanned by variable winds that really made the job tough. I hung on to the little 'copter to use in scouting the fire at practically tree level and to set up small spike camps of 2 to 4 men at several points where flare-ups were occurring.

"By this time the procedure was for the Air National Guard C-47 to come over the fire, spot us in the blind by radio and then make parachute drops of grub and supplies to the base camps. We used the little 'copter to distribute to the spike camps.

"The crews were now spread out in small groups over miles of fire line. We had 60 men on the fire at this time.

"A day and a half later we had the fire under control. We began releasing men to other fires that night and the following morning. By late afternoon the next day only 12 men were left on the fire with the 'copter to chase down smokes. The fire was mopped up during the next two days and the 'copter and men left for another fire. The fire was kept under patrol and declared out on June 20.

"All told we built about 10 miles of fire line, had 5 more held by a backfire from a water line, and the rest by direct attack.

"This fire burned 77,687 acres, of which 10,000 acres was forest land, 3,000 brushland, and the balance muskeg. About 20 million board-feet of timber was destroyed and countless migratory fowl eggs, for this is in one of the better known nesting ground areas. Total cost of suppression—\$53,093. Total resource loss is merely a guess; the timber was probably worth at least \$30,000. Watershed and wildlife losses have been estimated at \$135,314, or a total loss of \$165,000.

"This fire was out. But there were others. So back to work." **End**

ACTIVE ACRES

(Continued from page 11)

acquisition of public lands amounted to 22,808 in 1957, demonstrating the continuing increasing interest in public lands. The number of unclosed cases as of June 30, 1957, was 51,387 compared with 53,707 a year ago—a reduction of over 4 percent. The largest number of new cases involved applications for small tracts for home, business, or recreation sites. During the 1957 fiscal year 127,408 acres were classified for small tracts, the largest areas being in southern California. Withdrawals of public lands in the United States and Alaska during the year aggregated 291,810 acres. Lands restored from withdrawals totaled 1,736,595 acres or almost six times the total area withdrawn.

Abundant rainfall brought an excellent forage crop to areas of northern Nevada, southern Idaho, and southeastern Oregon, while other areas of the west experienced continued severe drought conditions. BLM programs for soil and moisture conservation continued to emphasize the importance of controlling runoff and erosion through construction of dikes, dams, and water-spreading systems.

Minerals exploration and development continued at a high level. During 1957 there were 90,509 new minerals cases and 92,132 cases were closed. Competitive mineral leases covering 196,896 acres were issued involving bonus reve-

nues of \$1,494,670. No new leases were issued in the submerged lands of the Outer Continental Shelf.

Timber sales during fiscal year 1957 involved 781 million board-feet valued at \$21,262,022, of which 629 million board feet was harvested from the Bureau's western Oregon forest lands. To date more than \$22 million has been appropriated for access road construction and 165 miles of mainline access roads and 15 bridges have been built or are now under construction. Special programs for timber inventories were scheduled.

As the result of a comprehensive study project, marketing area restrictions for timber cut on the Bureau's western Oregon forest lands were revoked on April 1, 1957. These restrictions had formerly required that timber cut from these lands receive primary processing within the marketing area in which it was harvested.

Copies of the *Annual Report of the Secretary of the Interior* are available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at \$1.50 per copy.

End

WHAT IS IT? (See pictures on page 11.)

Only a few people will probably correctly identify this curious object as a snowshoe made for a horse. The wooden base is about 14 inches square, with a steel angle iron bolted to the bottom. On the top of the board are a slot and two holes into which the horseshoe fits. A faint outline of the impression made by the horseshoe is visible in the picture. A metal band over the front of the hoof, tightened with the nuts underneath, holds the snowshoe on.

Though never widely used, similar snowshoes have been used in some areas of the West and in Alaska. Very few have probably been used or seen in the last quarter century.

This specimen was found by a BLM field examiner in Alaska and is now on exhibit in the museum of the Anchorage Historical Society, to whom it was donated.

End

OFFICIAL BUSINESS

ROUTES OF PRINCIPAL EXPLORERS 1700-1852

